MEMORANDUM

Department of Environmental Quality
Division of Waste Program Coordination

SUBJECT: Guidance Memo No. 03-2002 (9 VAC 20-160) Guidance for Addressing Contaminated Groundwater at Voluntary Remediation Program Sites

This document is to establish Voluntary Remediation Program (VRP) guidance to address issues associated with contaminated groundwater, particularly in the assessment of risk posed by that contamination.

TO: Waste Program Managers and Staff, Waste Regional Compliance and Enforcement Managers

FROM: Karen Jackson Sismour
Director of Waste Program Coordination

DATE: April 16, 2002

COPIES: Office of Remediation Staff

I. Introduction

The purpose of this document is to establish Voluntary Remediation Program (VRP) guidance to address issues associated with contaminated groundwater, particularly in the assessment of risk posed by that contamination.

II. Background

Groundwater contamination presents unique concerns since dissolved contamination has the potential to migrate both on-site and across site boundaries. Components of the Voluntary Remediation Report such as site characterization risk assessment and evaluation of engineering or institutional controls must take into account this potential migration of contamination and its impact on both on-site and off-site receptors. This guidance establishes the baseline criteria for not considering potable use of groundwater in the risk assessment component of the Voluntary Remediation Report.

III. Guidance for Addressing Contaminated Groundwater at Voluntary Remediation Program Sites

1. Site Characterization

The primary goal of an adequate characterization of ground water contamination is to obtain an accurate measure of the magnitude and extent of the concentration of any contaminant. Particular attention should be focused on the proper location and installation of monitoring wells, and implementation of the appropriate sample collection procedures and laboratory analyses.

It is also important to assess the on-site soil contamination as a potential source for groundwater contamination. This would include the determination of contaminant concentrations in the soil matrix, and an evaluation of the potential for dissolution into aqueous phase and migration through the vadous zone to the water table. These results should be integrated into a conceptual site model, which would incorporate actual and potential ground water concentrations. The site characterization report should include this site model.

If ground water contamination is found or suspected, then further hydrogeologic characterization would be required to assess ground water flow parameters and implications for the mobility of contamination including the potential for offsite migration.

At a minimum, the participant should demonstrate that the migration of groundwater contamination has stabilized or is retreating before its risk to human health and the environment can be assessed. This entails that the site characterization activities be sufficient to show that any contaminant plumes have reached a steady state or equilibrium condition. If ground water modeling is used to make contaminant fate and transport predictions, then additional ground water characterization, and possible post-certification monitoring, may be required at selected locations to validate model predictions.

2. Risk Assessment

The default exposure assumption to be utilized by the VRP when assessing risks from contaminated groundwater is the potable use of groundwater. Contaminated groundwater that exceeds the appropriate residential standards (e.g. Maximum Contaminant Levels (MCLs) or risk based concentrations) based on this default assumption must be remediated or the exposure pathway must be eliminated by engineering or institutional controls.

The risk assessment must also consider both deliberate and inadvertent exposure to contaminated groundwater for potential on- and off-site receptors. Such exposures would typically include intrusive scenarios associated with utility/construction activities

and potential volatilization of volatile organic compounds from groundwater into buildings.

Detailed risk assessment guidance regarding human health risk is available in a separate document (see http://www.deq.state.va.us/vrprisk).

In addition to the human health risks associated with contaminated groundwater, the risk assessment must consider ecological impacts on hydraulically connected surface water bodies and associated sediments.

3. On-site Considerations

Land use controls, which can include both institutional and engineering controls, may be used to mitigate unacceptable risk. Restrictions placed on the deed to the property will be required to control or restrict property usage if such restricted uses are incorporated into the risk assessment. For example, if any constituent in the groundwater exceeds its MCL, then a site-specific deed restriction prohibiting the future use of groundwater will be the required institutional control for groundwater underlying the site if consumption of groundwater is to be ruled out of the risk assessment. Another example of an institutional control would be a deed restriction prohibiting future residential land use if groundwater remediation levels, determined by potential volatilization of contaminants into building air, were too high for residential exposure but acceptable for exposures realized during commercial/industrial use. Engineering controls that could be incorporated into a deed restriction include ground water treatment and/or hydraulic control measures. Specific building design requirements such as the use of vapor barriers may also be appropriate engineering controls to eliminate a particular migration pathway.

If land use controls are approved as part of an exposure mitigation action, then the Certificate of Satisfactory Completion of Remediation must incorporate such restrictions as a condition of issuance and be recorded with the deed to the property. Separate guidance has been developed on the issuance of Certificates of Satisfactory Completion of Remediation (Certificate), which discusses this process in detail. Recording the restrictions on the deed to the property ensures adequate notification to future property owners about the use restriction(s) and allows for the immunity associated with successful program completion to run with the property.

4. Off-site Considerations

If the participant desires to eliminate the potable groundwater ingestion pathway assumption from consideration in the risk assessment beyond the boundaries of site specific deed restriction, documentation from the relevant locality must be provided to verify local prohibitions on the use of the impacted aquifer. The Virginia Department of Environmental Quality (DEQ) is aware that many localities have ordinances or restrictions against installation of domestic wells for potable use, however DEQ will not

take responsibility for interpreting local ordinances. Documentation must be provided in the form of formal correspondence from the appropriate local entity to DEQ, interpreting and attesting that their local ordinances/regulations prohibits or restricts groundwater use in the areas affected by the contaminated groundwater. Alternate mechanism such as a domestic well surveillance plan, or other comparable instruments approved by the appropriate local agency with jurisdiction over groundwater well installations in the affected area can be considered. It is the participant's responsibility to facilitate the submission of this correspondence to DEQ. Because DEQ is basing its offsite groundwater use assumption on the local government entity's enforcement of the prohibitions preventing groundwater use, any submitted documentation should clearly state that groundwater use in the vicinity of the site is restricted and is enforced. An example letter to the local entity requesting interpretation of any applicable ordinances has been provided as an attachment to this guidance. Its use is strongly advised. When a Certificate is issued based on a local prohibition on the use of impacted aquifers, the VRP staff should provide a copy of such a Certificate to the local entity with jurisdiction over the prohibition. If adequate documentation cannot be provided, groundwater conditions must be remedied so that constituents in the groundwater are at or below applicable MCLs of the limits of the Site-Specific Deed restriction.

5. Ecological Receptors

In addition to the human health risks associated with contaminated groundwater, the program participants must consider ecological impacts on hydraulically connected surface water bodies. To obtain a Certificate for a site with groundwater contamination, a participant must provide an adequate demonstration that the groundwater contamination will not present an unacceptable risk to ecological receptors located in hydraulically connected surface water bodies and associated sediments. A demonstration must be performed to show that groundwater contaminant concentrations will not result in surface water concentrations that exceed the Virginia Standards for Surface Water for the protection of aquatic life. A demonstration also must be provided that sediments affected by the site concentrations do not exceed the appropriate criteria. In the event that the Virginia Surface Water Standards do not include a value for a specific contaminant, the federal Ambient Water Quality Criteria may be relied upon. If neither of these sources contains a value for the contaminant, the participant should propose an alternative ecological benchmark.

IV. Other Applicable Information

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1. Further Information, Limitation of Guidance; Revisions

A general description of the VRP can be found on the Department's Website, http://www.deq.state.va.us, under **Waste Management**.

This guidance document is intended for the use of the public, applicants for the VRP, and Department staff. It creates no rights, legal or equitable, in any person, and is subject to change without notice as circumstances may require.

This Guidance document is intended to help minimize delay and expense in remediation, while continuing to protect human health and the environment. Any suggestions or questions should be sent to:

Office of Remediation
Waste Division
Virginia Voluntary Remediation Program
Virginia Department of Environmental Quality
P.O. Box 10009
Richmond, VA 23240

Suggestions or questions concerning this Guidance can also be sent by e-mail to Kevin L. Greene, Remediation Program Manager, at klgreene@deq.state.va.us.

2. Attachment: Boiler Plate Format Letter to Local Government about Groundwater Use Restrictions

Attachment

Boiler Plate Format Letter to Local Government about Groundwater Use Restrictions

Re: XYZ Site

Dear Local Official:

The above referenced site is participating in Virginia's Voluntary Remediation Program (VRP) administered by the Virginia Department of Environmental Quality (VDEQ). The site was entered into the VRP to address environmental concerns at the site. The VRP allows the use of risk-based criteria in evaluating potential risks to human health and the environment. Data collected from site investigation activities indicate that groundwater beneath the subject site has been impacted by pollutants above Maximum Contaminant Levels established for drinking water. Furthermore our data indicate that there is a potential for contaminated groundwater to migrate beyond the limits of our property.

The default exposure assumption utilized by the VRP when assessing risks from contaminated groundwater is the potable use of groundwater. Contaminated groundwater that exceeds the appropriate residential standards (e.g. Maximum Contaminant Levels (MCLs) or risk based concentrations) based on this default assumption must be remediated or the exposure pathway must be eliminated by engineering or institutional controls. We are proposing to the VDEQ the establishment of an institutional control in the form of a site specific deed restriction to prohibit the use of groundwater at the site (or to eliminate the use of groundwater at our site.) However, because we do not have legal control over adjacent properties, the VDEQ is requiring that we provide documentation to ensure that groundwater beyond the limits of our site will not be used in the future. This documentation will allow us to eliminate the potable use of groundwater in our site specific risk assessment for potential off-site receptors.

The VDEQ is aware that many localities have ordinances or restrictions against installation of domestic wells for potable use, however VDEQ will not take responsibility for interpreting local ordinances. To that end, this letter is requesting a verification that you have been notified about the groundwater contamination and provide a statement that applicable codes, regulations, etc. established by [Local Government Entity], prohibit the use of groundwater in the immediate vicinity of the impacted groundwater. I have enclosed a map to show the location of our property and predicted extent of the groundwater impact.

Please direct your response to [VRP Project Officer] at VDEQ, Voluntary Remediation Program, P.O. Box 10009, Richmond, Virginia 23240.

Thank you for your timely attention to this matter. I can reached at (XXX) XXX-XXXX, if there are any questions about the nature of this request.

Sincerely,

[Participant or Participant's Agent Name]